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ABSTRACT

This study was conducted to determine if viewing a commercially prepared videotape containing written and aural subliminal messages was more effective at producing weight loss than a videotape containing the same content, but without the subliminals. Participants included undergraduate and graduate students from Iowa State University (N=51) who were randomly assigned to two treatment groups: the experimental group who viewed the 22-minute weight loss videotape with subliminals, and the control group who viewed the same tape without the subliminal messages. After 25 viewings, within a 37-day period, subjects were measured to see if changes occurred in these areas: (1) attitude toward food and exercise (FEAT); (2) behavior toward food and exercise by change in weight and percentage of body fat; and (3) behavior toward food and exercise by incidence of high calorie-low nutritional food intake (FIR). The first two hypotheses were not supported as the tape containing the subliminal messages was not found to be more effective at producing weight loss or loss of body fat in viewers than a tape without the subliminals. Although the experimental group did show more improvement in their attitudes toward food and exercise, the difference was not significant, and the third hypothesis was also rejected. Four recommendations for further study are suggested, a list of references and two sample questionnaires are appended, and seven tables are contained in the text. (JB)

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TITLE: Old Wine in New Bottles: Subliminal Messages in Instructional Media

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Platters laden with fried chicken and potatoes, spaghetti smothered in tomato sauce, cream cupcakes and chocolate bars spin slowly round on the screen. Oddly enough, these treats aren't displayed to tempt you. They appear as reminders of foods you should avoid eating.

"Watch now, and start to say good-bye to the wrong kinds of foods," says the silky-voiced female narrator. "With daily viewing, you will watch your desire for fattening foods simply disappear."

This scene was from the twenty-two minute videotape, "Weight Loss Programming," by Hypnovision, that was designed to help viewers lose weight through daily viewing. Besides providing basic information on diet and exercise, the video used visual and aural subliminals. The visual messages were flashed on the screen for one-thirtieth of a second at regular intervals and the audio messages were compressed, mixed with music and transmitted just below the threshold of normal hearing.

Subliminal perception (or stimulation) describes any word, image or sound that is not perceived within the "normal" range of consciousness, but makes an impression on the mind. This involves words or pictures that are flashed so quickly that the eye cannot transmit them to the conscious brain, or words at such a volume that they evoke no conscious memory.

This past year a variety of products have appeared on the market that have the mystique of subliminals and promise improvement in a variety of areas. Audio tapes, with the subliminal messages transmitted below the threshold of audible sound, offer to transform the listener's life. Stimutech, Inc. has a device that interfaces a computer with a television allowing the viewer to receive subliminal messages while watching TV. Greentree Publishers offer a computer program that allows the computer operator to write one's own subliminal messages. These messages are flashed regularly as the programmer continues on with other computing tasks. Several videotape companies produce videotapes like the one described above. Most of these tapes encourage replacement of bad habits with healthier ones. The ads for these products emphasize that the subliminal programs will help bring about dramatic results with minimal effort. This presents an attractive proposition to the consumer. However, whether they do what they claim is open to debate. Many mental health professionals and psychologists do not agree as to whether subliminal communication is effective in changing human behavior and attitudes. Second, these subliminal products have been introduced to the market, yet they have not been clinically tested. Silverman, formost investigator in the use of subliminal stimulation to direct manipulation of behavior, believes that companies that sell subliminal products designed to affect bahavior should set up a research unit that tests their products (Levy, 1984). Currently, there is no documentation of any testing of these products to determine the effectiveness of their subliminal messages.

Purpose of Study

The purpose of this research was to conduct a study to determine if viewing a commercially prepared videotape containing written and aural subliminal messages was more effective at producing weight loss than a videotape containing the same content but with no subliminals.

"Weight Loss Video Programming," by Hypnovision, the videotape selected for this study, endorsed no particular diet or exercise plan, and made no requirements of the viewers other than the willingness to change diet and exercise habits and to watch the videotape daily for thirty days. It was felt that, while weight loss was not a traditional focus of educational research, the availability of this particualr videotape would give insights into the effectiveness of subliminal messages that might have a direct relationship to traditional educational needs. Subjects were measured to see if changes occurred in these areas:

1) BEHAVIOR

Food Intake Recall (FIR)--measured by one day food recall at the end of the testing period. This analyzed the subjects' food intake for nutrients and calories. The FIR was used to compare the amount of intake of high calorie, low nutritional foods.

Weight and Skinfold Test (WST)-- measured at the beginning and end of the testing period. Skinfold tests reveal and approximate percentage of body fat. All skinfold tests were performed by the same physical education instructor who was experienced in administering skinfold tests. To increase accuracy. three measurements were taken at each skinfold testing and these scores were averaged. Subjects were also weighed at the beginning and end of the experiment on the same scale, by the same person.

2) ATTITUDE

Food and Exercise Attitude Test (FEAT)--administered at the beginning and end of the testing period to measure the effectiveness of the subliminal messages on the tape: "EAT LESS", "GET ACTIVE", "CALM", EAT SLOW", "YOU CAN DO IT". The attitude test items were chosen from existing food attitude test items that were relevant to the subliminal messages and that fell into the following categories: eating for internal reasons, eating for external reasons, oral control, basic diet and exercise behavior. The subjects responded to the twenty FEAT questions on a five-point Likert scale ($r = 0.72$).

Treatment groups

1) The experimental group consisted of viewers who watched the twenty-two minute Weight Loss videotape with subliminal messages. This group was composed of those subjects randomly selected and placed in the yellow and orange groups.

2) The control group consisted of viewers who watched the twenty-two minute Weight Loss videotape without subliminal messages. This group was composed of those subjects randomly selected and placed in the blue and green groups.

Hypotheses:

The general hypothesis was that subjects receiving subliminal stimuli in a postive, emotionally arousing way would be able to stop a related and undesirable type of behavior (by mirroring) with greater success than subjects not receiving those messages.

1) Subjects viewing the videotape with the subliminals will show a greater weight loss than those viewing the videotape without subliminals.

2) Subjects viewing the videotape with the subliminals will show a greater loss in percentage fat than those viewing the videotape without subliminals.

3) Subjects viewing the videotape with the subliminals will show a better attitude toward eating healthier foods and exercising than those viewing the videotape without subliminals.

4) Subjects viewing the videotape with the subliminals will record fewer instances of high calorie, low nutritional food intake than those viewing the videotape without subliminals.

5) Subjects viewing the videotape with the subliminals will be able to maintain the weight loss for a longer period of time than those subjects viewing the videotape without subliminals.

Experimental Design:

Campbell and Stanley's (1963) experimental design number four, the Randomized Pretest-Posttest Control Group Design, was used in this study. Students were randomly selected for treatment groups, a pretest was given and preliminary measurements were taken. After the treatments were administered, a posttest was given and final measurements were taken. The import of the treatments was determined by subtracting subjects' pretest scores from posttest scores. The appropriate test for significance at the .05 level was then applied to ascertain if the difference was greater than what might occur due to chance. For this experiment, this design was considered superior to others (Campbell and Stanley, 1963).

Dependent Variables:

1) Measure of subject's attitude toward food and exercise (FEAT).

2) Measurement of subject's behavior toward food and exercise by change in weight and percentage of body fat.

3) Measure of subject's behavior toward food and exercise by incidence of high calorie-low nutritional food intake (FIR).

Independent Variable:

1) Videotape viewed by subjects:
   A. Videotape on weight loss containing subliminals.
   B. Videotape on weight loss not containing subliminals.

Subjects:

Subjects participating in this study were undergraduate and graduate students, and staff from Iowa State University who responded to advertisements in the campus newspaper or to flyers posted in buildings on the campus during Spring Semester, 1985. Those interested attended one of three orientation sessions. The orientation sessions were conducted to explain the study, to explain the participants' responsibilities and to answer questions.

Subjects' responsibilities were: 1) to get a signed medical clearance, 2) to take the FEAT pretest, be weighed, and be given the skinfold test, 3) to view an assigned videotape twenty-five times within a thirty-seven day period, 4) to return and be reweighed, be given the skinfold test, and take the FIR and FEAT posttest. If subjects met those requirements they were paid twenty dollars. Medical clearances were obtained at the campus health service at no cost to the participants. Fifty-nine subjects started the study and fifty-one fulfilled all the requirements.

The Videotape:

The videotapes used in this study, "Video Weight Loss Programming", were developed in 1983 by John Koenig of Hypnovision. Two videotapes were used: one with visual and audio subliminals (the commercially available version), and one without subliminals. Each videotape was twenty-two minutes long and the perceptible content of each videotape was the same. In order to accomodate the fifty-nine subjects viewing the tape daily, Hypnovision provided eight copies of each version. To equalize videotape wear and hinder subjects' knowledge of the type of tape they were assigned to, each subject was issued a color-coded card. Those with blue and green cards were control subjects. They watched the videotape without the subliminals. The yellow and orange groups (experimental subjects) watched the videotape with the subliminals. Tapes were viewed at the university library.

The content of the videotapes was basic, accepted information on diet, exercise and weight control. The videotape opened with scenes of running water while the narrator urged relaxation. Plates of donuts, candy bars and fried chicken revolved on the screen, and the viewer was told to resist these foods by saying, "No Thank You." During the course of the videotape viewers were told to eat slowly, take small bites and chew thoroughly. They were instructed to drink up to eight glasses of water and exercise daily. Several types of exercises were demonstrated as the subliminal audio message, "YOU CAN LOSE WEIGHT NOW" was repeated 200 times during the music sequence. The visual subliminals were one frame edits that were flashed every five to ten seconds at a speed of one-thirtieth of a second. This was below most people's ability to perceive them. These messages were "EAT LESS", "GET ACTIVE", "CALM", "EAT SLOW", and "YOU CAN DO IT". Both videotapes stated that they contained subliminal messages and the messages were printed on the screen during the introduction. Both videotapes began with scenes of flowing water and viewers were told to relax. As the name of the company implied, the videotape attempted to put the viewer in a relaxed state so that the information and the subliminals presented would have more of an effect.

Review of the Literature:

The idea of whether individuals can be affected by their environment without conscious awareness has fascinated many for more than two thousand years. Spence (1961) described the mechanism by which unconscious stimuli can affect behavior. According to Spence, memory traces are organized in the unconscious into semipermanent aggregates called schemata. A schema is an organization of ideas, memories, and concepts that are linked through association. Subliminal activation of a schema occurs when a word or image enters the unconscious and becomes attached through association to the general schema. Because of the emotional content of the stimulus and because memories and ideas already comprising the schema are meaningfully related, the subliminal stimulus activates the entire schema.

Signal-detection theory (Swets, Tanner and Birdsall, 1961; Tanner and Swets, 1954) has explained how unconscious stimuli can be processed without conscious awareness. Signal detection theory assumes all signals impinging on an organism contribute to a continuum of sensory activity and experience. All signals increase the probability of raising the excitation level to a point where the organism will report the signal's presence. The organism makes decisions regarding attending and responding on the basis of decision rules, that are based on the comparison of incoming signals relative to the needs of the organism. Since all signals are processed, all information exists within the organism. Certain information is attended to and consciously experienced while the rest does not gain conscious recognition. Hence, some experiences are filtered out before they reach consciousness because they are not recognized as signals, yet they are still processed.

While the controversy over subliminal perception has continued on theoretical and empirical grounds, there has also been public response to the subliminal effect. In 1957, this controversial phenomenon came to the public's attention when patrons in a movie theater in New Jersey were subjected to "HUNGRY? EAT POPCORN", and "DRINK COCA-COLA" messages flashed on the screen every five seconds throughout a film. General sales figures over a six-week period, compared with previous sales, increased 57.5%, and Coca-Cola sales by 18.1% (Brooks, 1958). Use of this technique drew immediate negative responses from the public. People did not want their subconscious minds influenced.

The foremost investigator in subliminal stimulation in psychology has been Lloyd Silverman (1976). Silverman's study of psychoanalytic dynamic activation relationships involved the tachistoscopic presentation of wish-related verbal and pictorial stimuli for provoking unconscious wishes subliminally. Psychoanalysts have posited that different symptoms of abnormal behavior are related to different unconscious conflicts and that symptoms can be viewed as symbolically expressing aspects of the particular underlying conflict.

Several studies have suggested that both situational and individual differences are related to the strength of subliminal effects. Fisher and Paul (1959), and Fiss (1966), found that when subjects were in a state of relaxed passivity, subliminal effects were maximized. Dixon (1971) suggested that subliminal effects were more likely to be found when subjects were in a low state of arousal. In this case, attention was unselective and cognitions were intuitive, global and unbound by logical constraints. On the other hand, high levels of arousal tended to diminish subliminal effects.

Subliminal stimulation has been explored in the area of learning and education. Five general areas where subliminal perception might be applicable to education were in the areas of problem solving, cognitive learning, motivation, elaborative thinking and perception (DeChenne, 1981-82).

Zuckerman (1960) had subjects produce stories after viewing the subliminal messages "WRITE MORE" or "DON'T WRITE". Their ability to produce stories mirrored the message they received subliminally. When presented with supraliminal messages that were easily recognizable, "WRITE MORE" and "DON'T WRITE", the performance of subjects at producing stories were not affected by the messages they received. Zuckerman felt this was an example how a subliminal stimulus could by-pass processes of conscious intent and revealed that it might be impossible to resist the instruction of imperative subliminal messages that were not consciously experienced.

Smith, Spence and Klein (1959) tested to see if word meaning alone had a subliminal influence on conscious thought. When the words "ANGRY" and "HAPPY" were exposed subliminally and were immediately followed by a clear supraliminal figure (a blank, expressionless face), the subliminal words influenced impressions of the latter. Descriptions of the face were pleasant in "HAPPY" pairings and unpleasant in "ANGRY" pairings.

Parker (1982) found that subjects who were normal college students who received subliminal stimulation "MOMMY AND I ARE ONE" and "MY PROF AND I ARE ONE", in conjunction with teaching and counseling, received significantly higher grades than similar students who received the control stimulation "PEOPLE ARE WALKING". Parker agreed with Silverman that subliminal stimulation had an adaptive enhancing effect on behavior.

Experiments in education that did not reveal dramatic positive results of subliminal stimulation included studies by Severance and Dyer (1973) and Grant, Blohm and Ledford (1981). Severance and Dyer found that the presence of a subliminal color interfering word did not affect color naming. They further questioned if subliminal effects were restricted to those that produced emotionally laden responses, since words like red, blue and green were neutral and lacked emotional meaning.

Grant, Blohm and Ledford (1981) investigated the effects of subliminal stimuli on the development and improvement of execution of racquetball ceiling shots, and increased racquetball participation. Results showed that females could possibly be affected by visual subliminal stimulation to a greater degree than males, and questioned if filming subjects' performances and presenting it to them subliminally would better arouse them and lead to improved learning of this psychomotor skill.

These studies reveal two types of effects that can be produced by subliminal stimuli: the mirroring effect and the effect of arousal and learning from emotionally laden stimuli. These are related to habit breaking and habit forming behavior.

Attitudes are seen as enduring predispositions that are not innate but are learned. Thus, even though attitudes are not momentarily transient, they are susceptible to change (Zimbardo, Ebbesen, and Maslach, 1977). In 1931, Thurstone demonstrated the impact of film on attitudes. By using two films, one depicting the Chinese favorably and the other unfavorably, Thurstone found it was possible to produce either positive or negative changes in attitude toward Chinese people (Thurstone, 1931).

Though media are mere carriers of information and do not directly influence learning under any condition (Clark, 1983), there are approaches and techniques using media that seem to maximize desirable attitudinal outcomes. Simonson, at Iowa State University, has been investigating the topic of instructional media and attitude change for the past several years (1979, 1980, 1981). He outlined six guidelines that can promote certain attitudinal outcomes in learners. The guideline most relevant to this study was guideline six that stated: Learners who experience a purposeful emotional involvement or arousal during instruction are likely to have their attitudes changed in the direction advocated as the purpose of the mediated message.

It has often been reported that an efficient method for changing behavior would be to change one or two underlying general dispositions or attitudes. Festinger's (1957) theory of cognitive dissonance is based on the idea that human beings demonstrate a great desire for consistency and congruity in their attitudes and behaviors and, conversely, find conflict between what they know and what they do disturbing and discomfiting (Zimbardo, Ebbesen, and Maslach, 1977).

Festinger (1964) suggested that, when opinions or attitudes are changed through the impact of persuasive communication, this change is unstable and will disappear unless an environmental or behavioral change can be brought about to support and maintain it. The data show that the occurrence of behavior change does not depend upon the prior occurrence of an attitude change, or vice versa. Greenwald (1966) contended there was no automatic relationship between attitude and behavior; rather, they may be independently determined by the environment. Normally, the environment will produce in persons parallel effects on belief and behavior, so these concepts will appear to be correlated. In special situations, such as persuasion following an opposing commitment, the environment exerts differential pressures on belief and behavior and then they appear to be uncorrelated (Greenwald, 1966).

Summary:

Subliminal stimulation is a phenomenon that has been shown in some instances to influence basic drives, though the strength of these effects seem to be related to situational and individual differences. Subliminal effects are maximized when subjects are in a state of relaxed passivity. High levels of arousal tended to diminish subliminal effects. Subliminal stimulation might influence learning, and two effects produced by subliminal stimuli were the mirroring effect and the effect of arousal and learning from emotionally laden stimuli.

Media can be used to change attitudes. Learners who experience a purposeful emotional involvement or arousal are likely to have their attitudes changed in the direction of the mediated message. Change in attitudes does not necessarily mean a change in behavior.

Results:

Hypothesis 1: Subjects viewing the videotape with the subliminals will show a greater weight loss than those viewing the videotape without subliminals.

The descriptive statistics shown in Table 1 indicated that the subjects assinged to the weight loss videotape with subliminals weighed less initially ($\bar{x}$ = 139.47 lbs.) than those assigned to the weight loss videotape without subliminals ($\bar{x}$ = 141.53 lbs.). After weighing at the end of the treatment, a change in weight was obtained by subtracting initial weight from weight after treatment. The data in Table 1 indicated that the viewers of the videotape with the subliminals lost an average of 1.84 pounds compared to the control group which lost an average of 2.66 pounds. Hypothesis 1 was not accepted.

Hypothesis 2: Subjects viewing the videotape with the subliminals will show a greater loss in percentage body fat than those viewing the videotape without subliminals.

The descriptive statistics shown in Table 2 indicated that the subjects assigned to the weight loss videotape with subliminals had a greater percentage of body fat initially, though they weighed less (Table 1) than subjects assigned the weight loss videotape without the subliminals. After skinfold measurements were taken at the end of the treatment, the change in percentage of body fat was obtained by subtracting initial percentage body fat from perentage body fat after treatment. Table 2 indicated that the viewers of the videotape with the subliminals lost an average of .41 percent body fat compared to the control group which lost an average of .53 percent body fat. Hypothesis 2 was not accepted.

Hypothesis 3: Subjects viewing the videotape with subliminals will show a better attitude toward eating healthier foods and exercising than those viewing the videotape without subliminals.

The descriptive statistics shown in Table 3 indicated that the subjects randomly assigned to the weight loss videotape with subliminals scored lower initially on the FEAT pretest than those assigned to the weight loss videotape without subliminals. After administering the FEAT posttest, the change of attitude was obtained by subtracting pretest scores from posttest scores. The data reported in Table 3 indicated that the viewers of the videotape with the subliminals showed an improved attitude toward food and exercise of 11.18 points compared to to viewers of the videotape without the subliminals that showed an improved attitude toward food and exercise of 7.37 points. However, the difference between the two groups was not statistically significant, and hypothesis 3 was not accepted.

Table 1. t-test: Viewers of weight loss videotape with subliminals vs viewers of weight loss videotape without subliminals in weight loss (H_1)

A. Descriptive statistics

	Weight		
	Before treatment	After treatment	Weight loss
Viewers of videotape with subliminals	x = 139.47 SD = 22.33 N = 27	x = 137.63 SD = 23.30 N = 27	x = 1.84 lb loss SD = 2.91 N = 27
Viewers of videotape without subliminals	x = 141.53 SD = 15.67 N = 24	x = 138.87 SD = 14.82 N = 24	x = 2.66 lb loss SD = 3.12 N = 24

B. t-test

Group	N	Mean	SD	t value	t prob
Viewers of videotape with subliminals	27	1.84 lb loss	2.91		
				.95	NS[a]
Viewers of videotape without subliminals	24	2.66 lb loss	3.12		

[a]NS = not statistically significant.

Table 2. t-test: Viewers of weight loss videotape with subliminals vs viewers of weight loss videotape without subliminals in loss of percent body fat (H_2)

A. Descriptive statistics

	Percent body fat		
	Before treatment	After treatment	Body fat loss
Viewers of videotape with subliminals	x = 30.90 SD = 6.05 N = 27	x = 30.09 SD = 6.02 N = 27	x = .41 loss SD = 1.92 N = 27
Viewers of videotape without subliminals	x = 28.10 SD = 6.76 N = 24	x = 27.57 SD = 7.09 N = 24	x = .53 SD = 2.29 N = 24

B. t-test

Group	N	Mean	SD	t value	t prob
Viewers of videotape with subliminals	27	.41 loss	1.92		
				.19	NS[a]
Viewers of videotape without subliminals	24	.53 loss	2.29		

Table 3. t-test: Viewers of weight loss videotape with subliminals vs viewers of weight loss videotape without subliminals in food and exercise attitude change (H_3)

A. Descriptive statistics

	Attitude[a]		
	FEAT pretest	FEAT posttest	Attitude change
Viewers of videotape with subliminals	x = 56.19 SD = 7.45 N = 27	x = 67.37 SD = 6.03 N = 27	x = 11.18 SD = 9.28 N = 27
Viewers of videotape without subliminals	x = 62.46 SD = 7.55 N = 24	x = 69.83 SD = 7.81 N = 24	x = 7.37 SD = 7.56 N = 24

B. t-test

Group	N	Mean	SD	t value	t prob
Viewers of videotape with subliminals	27	11.18	9.29		
				1.44	NS[b]
Viewers of videotape without subliminals	24	7.37	9.56		

[a]Higher scores indicate a more positive attitude.

[b]NS = not statistically significant.

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Hypothesis 4: Subjects viewing the videotape with the subliminals will record fewer incidents of high-calorie, low-nutritional food intake than those viewing the videotape without subliminals.

The descriptive statistics shown in Table 4 indicated that the subjects assigned to the weight loss videotape with subliminals reported an average intake of 3.15 servings of high-calorie, low-nutritional foods, during the 24-hour period of April 30 - May 1, after treatment, compared to the control group who reported an average of 2.21 servings. Hypothesis 4 was not accepted.

Hypothesis 5: Subjects viewing the videotape with the subliminals will be able to maintain the weight loss for a longer period of time than those subjects viewing the videotape without subliminals.

The descriptive statistics shown in Table 5 indicated that a random sample of eight subjects assigned to the weight loss videotape with subliminals reported a gain of .31 pounds 10 days after treatment (May 10, 1985) compared to a loss of .53 pounds from a random sample of nine subjects assigned to the weight loss videotape without subliminals. The change in weight was obtained by subtracting the weight after treatment on May 1, 1985 from weight on May 10, 1985. Hypothesis 5 was not accepted.

In order to attempt to determine why the hypotheses were not supported by the data, in post hoc research, a Pearson correlation was utilized. This was to determine if any relationships existed between the variables (Table 6). Statistically significant correlations were as follows:

1. Change in weight (difference in weight between initial weighing and weighing after treatment) was inversely correlated to change in attitude (difference in attitude toward food and exercise between pretest and posttest). Specifically, as weight change decreased, the change in attitude was more positive. This result was opposite of what was expected.

2. Change in weight (difference in weight between initial weighing and weighing after treatment) was correlated to FIR (Food Intake Recall). As weight change (loss) increased, the incidence of high-calorie, low-nutritional food intake increased. This result was opposite of what was expected.

3. Age was correlated to change in body fat (difference in percent body fat between initial measurements and measurements taken after treatment), as age increased, body fat percentage changed more.

The first two relationships were unexpected and difficult to explain. When a Pearson Correlation was performed only on the experimental group that viewed the videotape with the subliminals, the correlation between change in weight and change in attitude was not significant. Further examination is suggested. The third relationship of increase in age to increase of body fat was not too surprising. The majority of older subjects involved in sedentary jobs did not have as much available time to exercise as the college students. Also, older women tend to eat less rather than increase exercise for weight control.

Table 4. t-test: Viewers of weight loss videotape with subliminals vs viewers of weight loss videotape without subliminals in Food Intake Recall of high-calorie, low nutritional servings of food (H_4)

A. Descriptive statistics

	Food Intake Recall after treatment[a]
Viewers of videotape with subliminals	x = 3.19 SD = 2.93 N = 27
Viewers of videotape without subliminals	x = 2.21 SD = 2.57 N = 24

B. t-test

Group	N	Mean	SD	t value	t prob
Viewers of videotape with subliminals	27	3.19	2.93	1.21	NS[b]
Viewers of videotape without subliminals	24	2.21	2.57		

[a]Higher numbers indicate a higher incidence of intake of high-calorie, low-nutritional foods.

[b]NS = not statistically significant.

Table 5. t-test: Viewers of weight loss videotape with subliminals selected at random vs viewers of weight loss videotape without subliminals selected at random in weight loss ten days after treatment (H_5)

A. Descriptive statistics

	Reweigh ten days after treatment
Viewers of videotape with subliminals	x = .31 lb gain SD = 1.77 N = 9
Viewers of videotape without subliminals	x = .33 lb loss SD = 1.09 N = 9

B. t-test

Group	N	Mean	SD	t value	t prob
Viewers of videotape with subliminals	9	.31 lb gain	1.77	.61	NS[a]
Viewers of videotape without subliminals	9	.33 lb loss	1.09		

[a]NS = not statistically significant.

Table 6. Pearson Correlation: Relationships among the variables

	Age	Change in weight[a]	Change in body fat[b]	Attitude change[c]	FIR[d]
Age		.0048 (51) p=.487	.2275 (51) p=.054	.1648 (51) p=.124	-.0961 (51) p=.251
Change in weight			.4956 (51) p=.000	-.3345 (51) p=.008	.3650 (51) p=.004
Change in body fat				-.1460 (51) p=.153	.0592 (51) p=.340
Attitude change					-.0016 (51) p=.496
FIR					

[a]Change in weight = difference in weight between initial weighing and weighing after treatment.

[b]Change in attitude = difference in attitude toward food and exercise between pre and post FEAT test.

[c]Change in body fat = difference in percent body fat between initial skinfold measurements and measurements taken after treatment.

[d]FIR (Food Intake Recall) = incidence of consumption of high-calorie, low-nutritional food.

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After completion of treatments, subjects were given a questionnaire to complete. Questions were concerned with the effectiveness of the videotape that was viewed. Results were recorded in Table 7. The questions asked and a summary of responses are recorded below:

1. Do you believe you saw the tapes with the subliminals?

Ninety-three percent of subjects assigned to the videotape with subliminals believed they viewed the tapes with the subliminals, compared to twenty-one percent of the subjects assigned to the videotape without subliminals.

2. Do you feel the tapes are effective?

Seventy-four percent of subjects assigned to the videotape with subliminals felt the tapes were effective, compared to sixty-seven percent of the subjects assigned to the videotape without subliminals.

3. How did the tapes help?

Both groups reported the same top five responses; twenty-four percent in each group said that the tapes made them more aware of the foods they ate. Other responses indicated the tapes made them feel relaxed, helped them eat less, and motivated them to exercise more and to drink more water.

4. Would you like to continue watching the tapes?

Fifty-six percent of the subjects assigned to the videotape with subliminals respondend yes, compared to thirty-three percent of the subjects assigned to the videotape without subliminals.

5. Would you consider buying the tape if you have a VCR?

Forty-two percent of the subjects assigned to the videotape with subliminals said they would buy it, compared to thirty percent of the subjects assigned to the videotape without subliminals.

6. Other comments you might have about the experiment:

Both groups reported that the repetition of daily viewing became boring, but the videotape would be good to view before eating. All other comments are recorded in Table 7.

According to these responses, the viewers of both groups were generally aware if they were or were not receiving the subliminal messages. However, the viewers assigned to watch the videotape with subliminals were more favorable to the continuation of this type of weight loss program. The majority of both groups felt the videotapes were effective. When asked how the tapes helped, the most popular response for both groups viewing the videotapes was that it made them aware of what they ate. The importance of awareness was stressed throughout the content of the videotape.

Table 7. Responses from viewers of the "Video Weight Loss" tapes with and without subliminals upon completion of the treatment.

Viewers of videotape with subliminals		Viewers of videotape without subliminals	
Response	%	Response	%
1. Do you believe you saw the tapes with subliminals?			
Yes	93	Yes	21
No	4	No	71
Unsure	4	Unsure	8
2. Do you feel the tapes were effective?			
Yes	74	Yes	67
No	22	No	13
Unsure	4	Unsure	21
3. How did the tapes help?			
1. Made me aware of what I ate.	24	1. Made me aware of what I ate.	24
2. Motivated me to exercise more.	15	2. Relaxed me.	18
3. Helped me eat less.	15	3. Helped me eat less.	11
4. Relaxed me.	12	4. Motivated me to exercise more.	8
5. I drank more water.	10	5. I drank more water.	8
6. I ate slower.	10	6. I controlled fattening foods.	8
7. I controlled fattening foods.	7	7. Tape encourage me.	5
8. I took smaller bites.	2	8. I ate slower.	5
9. Tape encouraged me.	2	9. I took smaller bites.	3
10. I drank less alcohol.	2	10. Tapes gave reinforcement.	3
		11. I put food in perspective.	3
		12. Tapes offered suggestions.	3

Table 7. (Continued)

Viewers of videotape with subliminals		Viewers of videotape without subliminals	
Response	%	Response	%
4. Would you like to continue watching them?			
Yes	56	Yes	33
No	44	No	67
5. Would you consider buying the tape if you had a VCR?			
Yes	42	Yes	30
No	50	No	65
Unsure	8	Unsure	4
6. Other comments you might have about the experiment:			
"Worthwhile"		"Massage good"	
"Helped my eating habits"		"Good program"	
"Made me sleepy and hungry"		"Would like to see before eating"	
"Would like to see before eating"		"Boring" (three comments)	
"Boring" (three comments)		"Positive"	
		"Bouncing exercises"	

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The remainder of the responses from both groups were quite similar. The viewers of the videotape with subliminals received the subliminal message "CALM", although viewers of both groups said the tape relaxed them. Another subliminal message was "EAT LESS", yet both groups said the tape helped them eat less (ranked third). The subliminal message "YOU CAN DO IT" was flashed visually, plus the audio message "YOU CAN LOSE WEIGHT NOW" was compressed and transmitted with music on the videotape with subliminals. There was one difference, however. The comment that the tapes encouraged them was mentioned more by the viewers of the videotape without subliminals than by the viewers of the videotape with subliminals. This might mean that the subliminal messages were too similar to the preceptable content and were repetitious of that content, so that possibly the subliminal messages were rendered ineffective.

One can only speculate as to why no statistically significant results were produced. The repetition in the content of the videotape might have rendered the subliminal messages ineffective. Each videotape contained the same content of basic diet and exercise information which stressed that the viewer should eat less, exercise more, eat slower and relax. The subliminal messages were precisely the same, and thus, were repetitious of the videotape's content, and this reduced their effectiveness. It is also possible that subliminal persuasion and behavior change do not work.

Recommendations for Further Study:

There are four major recommendations for those who would replicate or improve this study. One is to improve the FEAT pre- and posttest to improve its reliability and ensure its validity. The second recommendation is to start the study earlier in the school year to allow sufficient time for reweighing, one, two, and three months after treatment.

The third recommendation would be to recruit participants who have access to kitchen privileges. This would allow participants to more easily apply what the videotapes advocated.

The fourth recommendation is to conduct this same study with the same tests and measures, but use an entirely different perceptable topic, such as one dealing with relaxation. Have on group view the videotape without subliminal messages and one group view the videotape with subliminal messages of "EAT LESS", "EAT SLOW", "GET ACTIVE", and "YOU CAN DO IT". After obtaining measures of the subjects' attitudes and behaviors toward food and exercise, there would be a clearer understanding of the effectiveness of the subliminal messages, regardless of the subject of the videotape.

Summary of Conclusions:

This study found that a commercially prepared videotape containing written and aural subliminal messages was not more effective at producing weight loss in viewers than was a videotape containing the same content but without the subliminals.

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Please place an (X) under the column which applies best to each of the numbered statements. All of the results will be strictly confidential. Most of the questions directly relate to food, eating and exercise. Please answer each question carefully. Thank you.

Always	Often	Sometimes	Rarely	Never	
( )	( )	( )	( )	( )	1. I am aware of the calorie content of foods I eat.
( )	( )	( )	( )	( )	2. I eat when I am not hungry.
( )	( )	( )	( )	( )	3. I eat faster than others.
( )	( )	( )	( )	( )	4. I can lose weight when I try.
( )	( )	( )	( )	( )	5. I follow a daily scheduled program of exercise.
( )	( )	( )	( )	( )	6. I am self-conscious about my weight.
( )	( )	( )	( )	( )	7. I exercise because I enjoy it.
( )	( )	( )	( )	( )	8. Even if I'm full, if something looks good I'll eat it.
( )	( )	( )	( )	( )	9. I do not eat some foods because they make me fat.
( )	( )	( )	( )	( )	10. Eating helps me relieve depression.
( )	( )	( )	( )	( )	11. I drink several glasses of water daily.
( )	( )	( )	( )	( )	12. When I feel rejected or lonely I eat.
( )	( )	( )	( )	( )	13. If I am hungry I eat fast.
( )	( )	( )	( )	( )	14. Exercise makes me feel calmer.
( )	( )	( )	( )	( )	15. I count calories.
( )	( )	( )	( )	( )	16. I consciously eat less than what I want.
( )	( )	( )	( )	( )	17. I exercise at least three times a week.
( )	( )	( )	( )	( )	18. I am very conscious of what I eat.
( )	( )	( )	( )	( )	19. When I get nervous I eat.
( )	( )	( )	( )	( )	20. I cut my food into small pieces.

Name_____ Number____

Address_____ Soc Sec No _____

_____

_____

Checks will be mailed by May 31 (the latest)

1) What color group were you in? _____

2) Do you believe you saw the tapes with the subliminals? _____
Why? _____

_____

3) Do you feel the tapes are effective? _____

4) How did they help you?_____

_____

_____

5) Would you like to continue watching them? _____

6) Would you consider buying the tape if you had a VCR? _____

7) Other comments you might have about the experiment:_____

_____

_____

_____

This information is confidential. Your name will not be given out or placed on a mailing list.

Would you briefly record the food you have eaten in the past 24 hours:

Breakfast	Lunch	Dinner	Snacks

Thank you very much for your participation! Would you like the results of the study sent to you at the above address?